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TECHNOLOGY DEPT

August 1, 1953

VOL. 64 NO. 5 PAGES 65-80

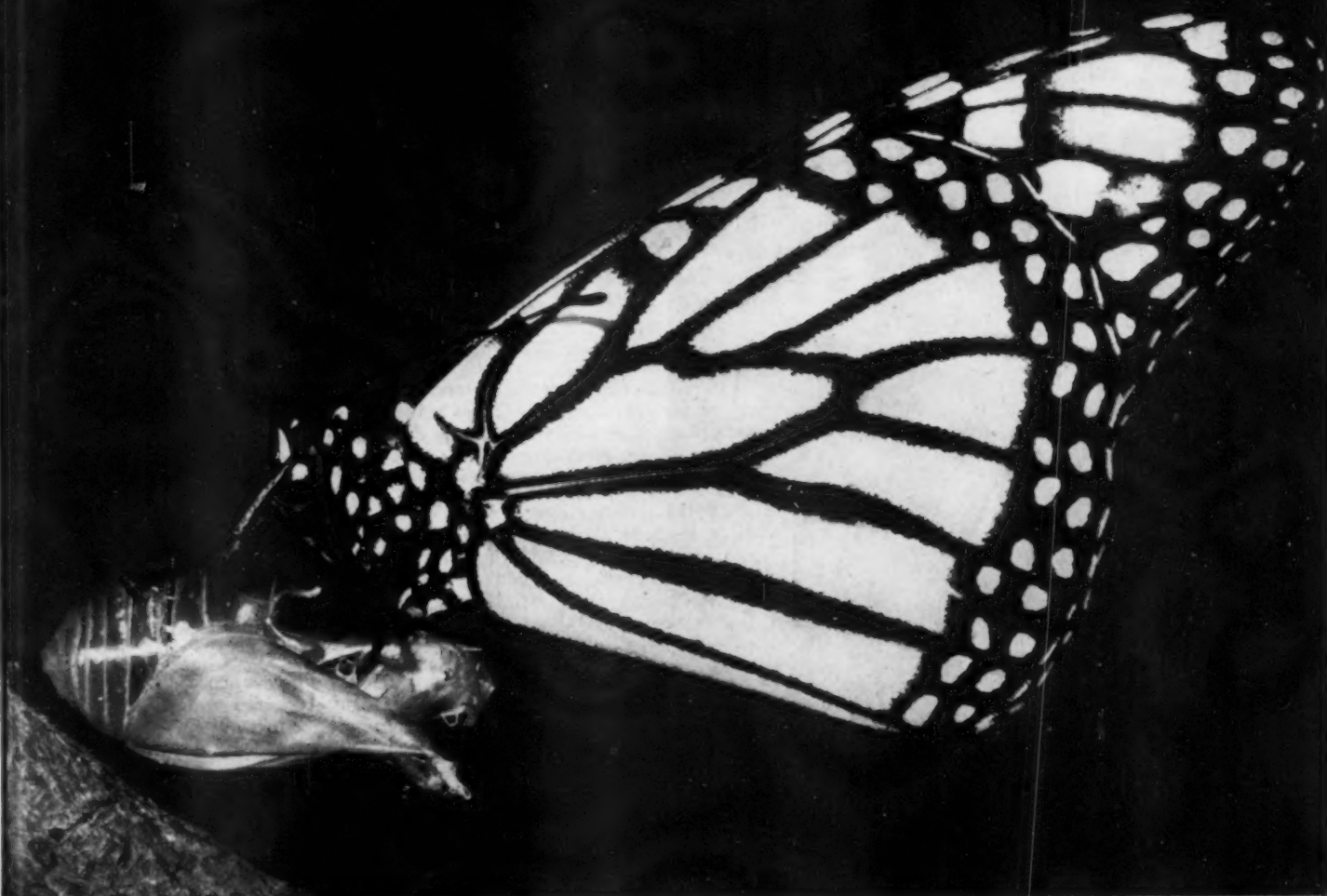
SCIENCE NEWS LETTER

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DETROIT

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Emerging Monarch

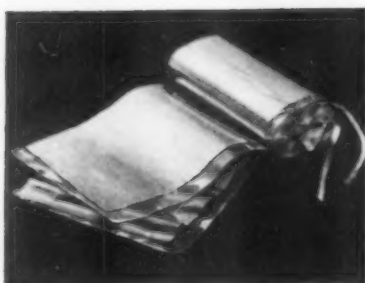
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A SCIENCE SERVICE PUBLICATION

*Now a new
synthetic
helps
dial telephone
service*



In a large, modern telephone office, two million relay contacts await the orders of your dial. They open and close a billion times a day.



Unrolled view (reduced size) of capacitor unit wound with "Mylar." The transparent film is only 0.0005" thick yet stands handling without breaking.

AMONG the elements that guard your dial telephone service are electrical capacitors. They help prevent the formation of arcs that pit and may eventually destroy relay contacts. But millions more of these capacitors are needed each year. How could they be made less costly?

Bell Laboratories engineers, on the lookout for new materials, became alert to the possibilities of the new "Mylar" polyester film. A product of the Du Pont Company, "Mylar" is chemically the same as Du Pont's "Dacron" polyester fiber used to make fabrics. Bell engineers discovered that it also had remarkable dielectric properties—of just the right kind to help their capacitor problem.

The film takes the place of impregnated paper once used to separate the metal foil electrodes. It is tougher, stands more voltage, needs no impregnation. The new capacitors require no protective housing and are *much* smaller and less costly.

Here is another example of the way America's technology advances through the sharing of knowledge. Just as Bell Telephone Laboratories makes many of its discoveries—the Transistor, for example—available to other companies, so does it adapt the inventiveness of others when it can help your telephone service.



BELL TELEPHONE LABORATORIES

Improving telephone service for America provides careers for creative men in scientific and technical fields

GENERAL SCIENCE

World-Wide Science

UNESCO survey shows that 28 countries have some type of central agency for promotion of research. Earliest operation, in 1916, was in U. S. and England.

► TWENTY-EIGHT COUNTRIES have established some sort of central agency for the promotion of research in different fields of pure applied science. This is shown by a survey of national research councils throughout the world made by the United Nations Educational, Scientific and Cultural Organization in Paris. (See p. 76.)

Some countries like the United States have more than one such organization. Both the National Academy of Sciences, with its National Research Council, and the governmentally operated National Science Foundation are included in the list of organizations or agencies used by governments to assist them in promotion and coordination of research.

The National Research Council in the United States shares with Britain's Department of Scientific and Industrial Research, the distinction of having begun operation in 1916, which is the earliest for organizations of this sort. The UNESCO report calls these research councils "the most modern development of the relations between scientific workers and the government."

"The twentieth century has witnessed a profound change in the attitude of governments towards science as well as in the character of science itself," the report explains. "During the last 50 years scientific research has ceased to be the prerogative of individuals working in isolation or in groups divorced from the social and economic problems of their environment."

"Two world wars, with their urgent problems demanding immediate solution, have accelerated the change in the character of science from an individual to a collective basis, and have forced many governments to an acute realization of their dependence upon science and scientists, not only for the standard of living but for the ultimate survival of their countries."

Science today depends to an ever-increasing extent upon the support of government, the report observes. No longer can private enterprise and endowment finance entirely the large scale research projects which this modern technical age demands. In many countries, universities can no longer finance from their diminishing incomes their expanding scientific departments and constantly growing demands for personnel and equipment.

The encouragement of scientific research important to the development of medicine, agriculture, industry and defense has become, the report states, the concern of the states in most of the scientifically developed countries of the world.

"With a world shortage of scientists," the

report says, "few governments today can afford to allow the scientific activities of their countries to proceed in a haphazard fashion, resulting in wastage of manpower and unnecessary duplication of scientific effort. The general co-ordination of research activities thus becomes added to the governments' function as a patron of research."

Whatever the means employed by agencies in various countries in the administration of government funds for the promotion of scientific research, there is fundamental consideration of maintaining a correct relationship between the government and the scientists, it was found in a survey.

The scientists need to be assured that the traditional environment to research will be preserved. This involves freedom of the scientist to select his own research projects, continuity of employment and freedom of communication and publication. The government needs to be assured that the money for research will be used for the best interests of the country as a whole.

Science News Letter, August 1, 1953



NIELS BOHR—Theoretical investigations for the newly-formed European Organization for Nuclear Research, which replaces the temporary Council, will be under the direction of Dr. Bohr. Construction of the laboratory in Switzerland is expected to take seven years and cost \$28,000,000. It will house two accelerators, a synchro-cyclotron and a proton synchrotron.



KALINGA PRIZE TO DR. HUXLEY—Dr. Julian S. Huxley (left) is shown receiving the Kalinga prize for science writing from Prof. Pierre Auger, director of UNESCO's natural sciences department. The international prize is awarded annually for outstanding achievement in interpretation of science to the public. A requirement for the award is that the winner visit India to study conditions there.

GENERAL SCIENCE

Federal Research Funds

► MANY SMALL U. S. colleges with scientific research resources are not being used for federally supported research, the National Science Foundation has found.

In the first of a series of reports on the current status of government research and development activities, the Foundation points out that less than one-third of the educational institutions with "immediate potential capacity" for carrying out research and development have received government funds.

Of the more than \$2,000,000,000 of federal funds spent for research and development during the year ending June 30, 1952, about \$338,000,000 went toward financing research at nonprofit institutions. All but two percent of this money was spent by four agencies—the Department of Defense, the Atomic Energy Commission, the Department of Health, Education and Welfare and the Department of Agriculture.

And these four agencies spent 83% of the research money at only 50 institutions, excluding "research centers," the Foundation discovered in its survey.

"This concentration," the report states, "is largely accounted for by the more fully developed scientific facilities and staff of the institutions receiving the most funds and by the critical national defense needs."

"Research centers," operated by nonprofit institutions for the government, have resulted from increased federal spending for scientific research. They seldom include educational activities. Usually carrying out specialized scientific programs, the research centers received a little less than half of the funds that were spent at all nonprofit institutions.

Four out of every five dollars that went to nonprofit institutions during 1951-52 was for applied research, development and large-scale additions to the research and development plants of these institutions. The other one-fifth went to basic research.

The report, entitled "Federal Funds for Science" (see p. 76), will be followed by other studies by the National Science Foundation on government expenditures for science.

Science News Letter, August 1, 1953

ANTHROPOLOGY

Search for Native Ills

► NEW EVIDENCE to show whether diseases like tuberculosis and syphilis were first introduced to American Indians by the white settlers from Europe, or afflicted the Indians in pre-Columbus days is expected from an X-ray study of bones in the Smithsonian Institution.

The research is a cooperative program conducted by Dr. T. Dale Stewart, physical anthropologist of the Smithsonian, and Dr. William J. Tobin, orthopedic surgeon, working with Sister Charles Regina, Georgetown University Medical Center, and experts of the Armed Forces Institute of Pathology.

Signs of tuberculosis have already been discovered in prehistoric Indian bones from the ruins of Pueblo Bonito, a 1,000-room apartment house found in New Mexico which dates back to about 1050 A.D. It is in such crowded-together conditions that tuberculosis might be expected to take its toll, rather than in the free-roaming life more typical of the early Americans.

Such pathological conditions have been found in prehistoric bones before, but the discovery has always been incidental. The search for such evidence of disease has not been done systematically before.

The present study is an extensive undertaking and is made possible only by the cooperation of scientists from the different fields of anthropology and medicine. A recent count in connection with an anniversary of the Smithsonian anthropology division shows that the Institution houses

some 18,000 skulls. By no means is every skull accompanied by a complete skeleton.

Early anthropologists had a way of picking up skulls and leaving other bones where they were found. But between one-fourth and one-third of the 18,000 skulls have other bones with them. Relatively few skeletons are complete with all 200 bones of the human body.

When all the bones have been examined, it may be possible to estimate the incidence of various bone diseases, fractures, and other pathological conditions, among the American Indians.

The X-ray study is made possible by a grant from the Picker Foundation, a research organization of a manufacturer of X-ray equipment.

Science News Letter, August 1, 1953

INVENTION

Patented Device Produces Sultry Movie-Star Lips

► THERE IS too much fuss, muss and time involved when women "put on" their lips, concluded two inventors of Miami Beach, Fla. So they invented a "lip imprinting device" that helps milady do the job with dispatch.

It works like a rubber stamp. Coated with the user's lipstick, the custom-made metal stamp impresses an outline over the user's lips so that the woman merely has to

fill in the color within the border. This eliminates the time-consuming "free-hand method" that also requires a great deal of skill and some guesswork, inventors Benjamin N. Greene and Sid S. Franklin confide.

Madame can have an impression of her own lips taken, and corrected to perfection. However, if she does not want to go to that trouble and expense, she may be able to buy stencils of sultry movie star lips at cosmetic counters. These ready-made lip designs should come in "many assorted sizes and styles," if patent No. 2,646,054 captures the American woman's fancy.

Science News Letter, August 1, 1953

SCIENCE NEWS LETTER

VOL. 64 AUGUST 1, 1953 NO. 5

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W., Washington 6, D. C., NORTH 7-2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C., under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 1 E. 54th St., New York 22, Eldorado 5-5666, and 360 N. Michigan Ave., Chicago 11, State 2-4822.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

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MORE EFFICIENT TRANSISTORS—Newest entries in the transistor field are "tetrodes" and "pentodes." They have three and four wires, respectively, running from the germanium nugget, instead of two, and can do the work of two or three of the triodes shown here during assembly.

ELECTRONICS

Transistor Family Grows

► THE TINY transistor, a five-year-old newcomer to the electronics field, now has two baby brothers.

Transistors are made of a rare metal, germanium, which is worth more than gold when suitably refined for transistor use. The pea-sized devices can amplify radio waves, music and speech, and can do many other jobs done by tubes such as are now used in radio and television sets.

The newest transistors are "tetrodes" and "pentodes." They differ in appearance from their big brother, the "triode," only in that they have three and four wires, respectively, running from the germanium nugget instead of two. Tetrodes can do the work of two of the older triodes. In some cases a pentode will do the work of three triodes.

This means that someday radio and television sets may be fantastically small, partly because transistors themselves are small, and partly because the new transistors will simplify electronic circuits.

Developed by Sylvania Electric Products Inc., the new transistors may find their first jobs in electronic computers.

The devices are still in the development stage, as is the older triode transistor. As yet, they cannot be used in critical radar circuits. This is because transistor performance is not standardized. If a transistor goes bad in a critical circuit, another

transistor usually cannot be substituted for it without a modification of the complete circuit.

However, transistors now are being used in some noncritical circuits of hearing aids. Future refinements should make them suitable to take over many of the jobs now done by vacuum tubes.

Science News Letter, August 1, 1953

INVENTION

Sampling Device For Drone Airplanes

► A "SNAP-SAMPLER" has been invented for drone airplanes that fly through radioactive clouds after atom bomb explosions. The device funnels air through a nozzle and traps a sample of the air and solid particles it contains in an air-tight bag inside the plane.

This is done in such a way that a representative sample of the cloud is collected in a suitable form for laboratory analysis.

The sampler was invented by Jerome Kohl of Berkeley, Elliott G. Reid of Palo Alto and Lloyd R. Zumwalt of Lafayette, Calif. The inventors assigned their patent, No. 2,645,940 to the Atomic Energy Commission.

Science News Letter, August 1, 1953

VITAL STATISTICS

Early School Years Show Highest Polio Death Rates

► THE HIGHEST death rates from polio have shifted from the pre-school to the early school ages, when the years 1930-42 are compared with 1948-52.

This is shown by figures compiled by Metropolitan Life Insurance Company statisticians.

The average death rate from acute poliomyelitis in the past five years was higher than that in any comparable period since the epidemic year 1916.

Science News Letter, August 1, 1953

ENTOMOLOGY

Monarch Butterfly Can Now Be Seen

See Front Cover

► THE MONARCH butterfly, *Danaus plexippus*, shown on the cover of this week's SCIENCE NEWS LETTER just emerged from its golden-spotted, jade-colored chrysalis, is one of the most common and handsome butterflies of American fields.

With the approach of winter, monarchs in the most northern states either die off or migrate in mass southward to hibernate. Adults appearing in these northern regions in June and July probably migrated there from the south. The butterfly is active all winter in the far south.

The monarch's caterpillar feeds exclusively on species of milk-weed; so the species is also known as the milk-weed butterfly.

Science News Letter, August 1, 1953

WILDLIFE

Fish Streams Poisoned By Drained-off Insecticide

► STREAMS CAN be made toxic to fish by drainage from fields treated with the insecticide, toxaphene, experiments by U.S. Public Health Service scientists in Cincinnati reveal.

Toxaphene washed into the streams with soil evidently is not made harmless by adsorption on the soil particles, nor is it effectively settled out of the water by sedimentation, Drs. Peter Doudoroff, Max Katz and Clarence M. Tarzwell of the PHS Environmental Health Center report.

Their experiments were carried out by placing small fish in aquaria into which samples of toxaphene-treated soils and filtrates of the soils had been added.

In other experiments, in which different insecticide powders were added directly to aquarium water, toxaphene was found to be the most toxic to fish, with aldrin next. DDT and BHC insecticides both were much less toxic than the first two in these tests, the scientists report in *Sewage and Industrial Wastes* (July).

Science News Letter, August 1, 1953

MEDICINE

New Drug Stops Rapid Beating of Upper Heart

► EXCESSIVELY RAPID beating of the upper part of the heart, supraventricular tachycardia, can be treated successfully by a relatively new synthetic drug, Drs. Alfred J. Berger and Robert L. Rackliffe of New Britain, Conn., General Hospital report to the *Journal of the American Medical Association* (July 18). The drug, methoxamine hydrochloride, was used to end attacks in two patients.

Science News Letter, August 1, 1953

ELECTRONICS

Explore New Range Of Radio Frequencies

► EXTREMELY HIGH frequency radio waves behave much like those used to carry television programs from coast to coast, the ultra-high and the super-high frequency waves.

Experiments by University of Texas engineers show that EHF waves, as they are abbreviated, can be beamed like radar and micro-wave television. Transmission range for EHF is held down to about 12 miles, however, reports Dr. A. W. Straiton, electrical engineering professor in charge of EHF research.

The extremely high frequency waves penetrate fog, but rain hampers transmission considerably.

The university research team is gathering basic information about EHF that should help developmental engineers find practical uses for it. Dr. Straiton and C. W. Tolbert will report technical aspects of their project to the August meeting of the Institute of Radio Engineers in San Francisco.

Science News Letter, August 1, 1953

MEDICINE

Heart Disease Discovered In GIs Killed in Action

► IN OVER three-quarters of autopsies of 300 battle deaths or accidental deaths of U.S. soldiers, mostly in their twenties, in Korea, the astonishing discovery has been made that they have gross lesions of their coronary arteries.

A medical team consisting of Maj. William F. Enos, Lt. Col. Robert H. Holmes and Capt. James Beyer reported in the *Journal of the American Medical Association* (July 18) that these seemingly healthy young men had varying degrees of heart disease that had gone unnoticed or had caused them no trouble.

About a fifth of the men had autopsy evidence of real disease with 40% or more narrowing of one of the major vessels of the heart. Three percent, or nine, had complete closing of one or more branches of the blood vessels.

Science News Letter, August 1, 1953



HUMAN RELATIONS RESEARCH—As part of a study of the satisfactions and dissatisfactions involved in industrial jobs, Cornell scientists are making field observations and interviewing workmen in the Steuben division of Corning Glass Works. Here, for purposes of later comparisons with mass production workers, the researchers observe men working with the same handcraft methods that have been used for hundreds of years.

PUBLIC HEALTH

Health Picture Is Bright

► AMERICA'S HEALTH picture is bright and encouraging even when the polio situation is included.

Only hepatitis, a liver disease, and scarlet fever, together with streptococcal sore throat, are running markedly above the number of cases reported either last year or for the past five years.

Measles, whooping cough and diphtheria are running well below the expected number of cases, based on the experience of the last five years.

Malaria has taken a large drop this year as compared with last year, with the incidence for the first half of this year only 523 cases as compared with 2,939 for the same period last year. Most of this decrease occurred among military personnel, although there has been a substantial reduction among civilians as well.

Some diseases, like smallpox, thanks to vaccination, are inconsequential as public health problems. There have been only 16 cases of smallpox reported since the beginning of the year.

There has been a rise in the number of cases of hepatitis, both the infectious sort and the sort that sometimes follows blood transfusions. This may be due to a better reporting of this disease. Hepatitis was

first reported only last year in the figures that are sent to the U.S. Public Health Service by the various states.

Figures through July 4, the latest that are complete, show 17,390 cases compared with 9,001 for the comparable period of 1952. This disease is relatively tough to handle, since the so-called wonder drugs, antibiotics and sulfas, are not effective curatively. In young people, the disease does not often leave bad effects, but in older persons, it acts something like typhoid fever did in the old days with accompanying liver damage.

The rise of scarlet fever and sore throat caused by streptococci, which is reported along with it, probably means that we are at the peak or approaching the peak in the cyclical occurrence of this disease. There have been 95,067 cases so far this year, compared with 72,305 last year and a 5-year median case rate of 52,805. Antibiotics are effective against scarlet fever, but many of the cases now are so mild that they need little treatment.

The health reports later in the year will include influenza and diseases which are now at a seasonal ebb, but from an overall standpoint the experts consider the health of the nation relatively good.

Science News Letter, August 1, 1953

PSYCHOLOGY

Life in Comic Strip World

► THE WORLD of the "funnies" is not the rough-and-tumble land of murder and mayhem that some adults think.

The truly altruistic, humanitarian atmosphere that pervades the comic strip was disclosed by a study of 52 nationally syndicated comic strips, including most of the favorites, conducted by Drs. Marvin Spiegelman, Carl Terwilliger and Franklin Fearing of the University of California.

The world of the comic strip is a man's world, the scientists found. Not only are there twice as many male as female characters, but the males fulfill more active roles, commonly outside the home, whereas the female characters take the more passive, "homey" parts.

Far from being a brute, the hero of the comic strip has as his chief goal service to the community. Recreation (sport) is also a chief interest as is the attaining of status.

Although a good many male characters are eager to gain wealth, disapproval of this goal is shown by the fact that this is the object of the unsympathetic characters—the villains.

Women in the funnies also want to serve, but their goal of second importance is romantic love instead of sport.

In this world the men are not primarily concerned with wooing and winning women. The women seek love while the men pursue sport.

There are very few villainous women in the comic strip world, but those who exist try to gain power and status.

A disproportionate number of comic strip women are from the upper classes, such as princesses. Men are more frequently from the lower economic brackets.

Both upper and lower classes are sympathetically presented. Both upper and lower class men seek above all to serve their fellow men. Justice and adventure are also sought after. Romantic love and vengeance are almost never goals for men.

Upper class women devote themselves to being loved and lovable; middle class girls try to make their way through hard work; lower class girls devote themselves to the service of others and to accepting their fate.

Details of the study are reported in the *Journal of Social Psychology*. (May)

Science News Letter, August 1, 1953

AERONAUTICS

British Pilots Wear Air-Cooled Suits

► BRITISH PILOTS soon will be wearing air-cooled suits while waiting inside their planes on landing fields in the blistering tropics. Air is pumped under the pilot's clothes to keep his body cool. The more clothes the pilot dons, the cooler he is.

Science News Letter, August 1, 1953

• RADIO

Saturday, August 8, 1953, 3:15-3:30 p.m., EDT
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Kenneth Landauer, assistant medical director, National Foundation for Infantile Paralysis, will discuss "Polio Patients Breathing Again."

ASTRONOMY

Star Can Grow in Three Million Years

► ONLY ABOUT three million years, a short time astronomically speaking, would be required for a star five times the size of the sun to grow "appreciably" when trapped in an interstellar cloud.

Dr. W. H. McCrea of the University of London made this estimate to the Royal Astronomical Society meeting in London.

Such a growth rate would furnish fresh hydrogen at least as fast as it is used up by the star. The growth, or accretion, theory was developed to account for the young, massive stars—giants in the sky some 30 to more than 100 times as massive as our sun.

Approximately one star in a million in our galaxy is of such a type, about five million years old, compared to an estimated five billion years for the age of the sun.

When a star is trapped in an interstellar cloud, the material just falls on to the star under gravity, Dr. McCrea stated.

For a star with a mass about twice that of the sun, "appreciable accretion takes place" in about eight million years. The accretion theory was first proposed by Drs. Fred Hoyle and R. A. Lyttleton, both of St. John's College, Cambridge, England. Dr. H. Bondi of Cambridge University has helped in its development.

Science News Letter, August 1, 1953

ELECTRONICS

Wonder Crystal Junctions Marked Electrolytically

► ELECTRONIC DEVICES, such as transistors, that substitute for electronic tubes depend upon one part of the germanium of which they are made conducting electrons, while the other part of the crystal does not.

A new way of discovering practically the invisible junction between these different regions is announced in *Nature* (July 18) by two scientists of the Associated Electrical Industries, E. Billig and J. J. Dowd.

The method is expected to be of use in manufacturing these advanced and useful electronic devices.

The boundary of what are called the n region, conducting electrons, and the p region, with electrical "holes," can be shown up by electrolytic etching. The junction acts as a rectifier, and electricity is forced through the metal so that the n, or electron, region is attacked and can thus be seen visually.

Science News Letter, August 1, 1953



SUPER-SWITCH—This giant switch for electric utilities can withstand a lightning stroke of 1,300,000 volts. The switch blade, about 17-feet long, can be operated manually or by an electric motor.

GEOLOGY

Gravity May Be Used To Locate Scarce Water

► IT MAY be possible to locate underground water in arid regions through the use of gravimetric measurements, in the same manner that minerals and petroleum deposits are located today.

Thane McCulloh, University of California at Los Angeles geologist, who has been making a study of the Mojave Desert basin, explains:

"Within the earth density variations result from structural inhomogeneities and cause small variations in the force of gravity at the surface. Through the use of a sensitive instrument known as a gravimeter, minute differences in the force of gravity can be measured.

"These differences allow the geologist to determine approximately the locations of masses of different density and from this to determine the underground structure. From these data favorable areas for exploration for petroleum and certain types of mineral deposits can be located."

The technique is being used in study of a Mojave Desert basin. Gravimetric measurements reveal the approximate depths at which bedrock underlies a thick sedimentary deposit of sand and gravel in the desert valley and suggest areas where deep water wells might be drilled.

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PEDIATRICS

Hints for Guarding Baby's Health on Journey

► WHEN BABIES go on a journey, special precautions are necessary to protect them from such dangers to their health as unsafe water, milk and other foods, sudden changes in temperature, flies and other insects that may spread disease, grown-ups and children who may be "coming down" with contagious sickness, and getting overtired.

Baby's regular routine or schedule for food, sleep and other activities should be followed as closely as possible. The food problem is easier if the baby is breast fed, but don't forget to arrange for boiling his drinking water as well as the bottles and nipples for it.

If the trip is to last only a day or 24 hours at most, the milk mixture, drinking water, bottles and nipples can be boiled at home before starting. The milk mixture and water can be taken in vacuum jars. The milk mixture must be thoroughly chilled before it is put into the vacuum bottle. If it is put in warm, it may sour. The vacuum bottle should be cleaned, scalded and cooled before the milk is put into it. Milk from a vacuum bottle should not be used after 24 hours.

If the trip is to be made by plane or train, arrangements can usually be made for keeping baby's bottles in the refrigerator of the

plane's galley or the train's dining car. In this case, the milk mixture can be made at home and put into nursing bottles that are well corked or covered. They should then be wrapped carefully in a clean cloth.

Nipples, boiled at home, should be carried either wrapped in sterile gauze or in a glass jar with a screw top.

For trips of longer than 24 hours arrangements must be made for boiling the milk mixture, drinking water, bottles, stoppers, nipples, measuring glass and funnel all during the trip.

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TECHNOLOGY

Glass Panels Heat Basementless Houses

► BASEMENTLESS BUNGALOWS too small to house furnaces can be heated with radiant glass panels set into the walls. The electric panels do a good job but cost more to operate than heating plants that use coal, oil or gas.

Designed to work on standard 115- or 230-volt household current, the panels consist of glass plates having a metallic coating on their backs. The plates are positioned in front of a heat reflector. Current flows through the metallic backing, generating heat.

This heat is beamed into the room by the reflector. It also warms air circulating between the reflector and hot glass panel.

Experiments carried out by Paul R. Achenbach, National Bureau of Standards scientist, revealed the panels kept a four-room test house comfortable while outdoor temperatures hovered between zero and freezing Fahrenheit.

Each room of the test house was heated with glass panels placed in the wall beneath windows. A total of 10 panels were installed, each rated at 1,000 watts.

Science News Letter, August 1, 1953

MEDICINE

Enzyme Chemical Cures Nose, Throat Discharges

► A CHEMICAL naturally found in the human body is used in a new way of treating bronchial asthma and similar conditions to rid the nose and throat of thick, viscous discharges that are so troublesome.

Reporting to the *Journal of the American Medical Association* (July 18), Drs. Leon and Albert Howard Unger of Chicago tell of using trypsin, an enzyme, in aerosol form upon 73 patients.

Inhalations of aerosol trypsin produced excellent results in most patients with bronchiectasis, acute atelectasis, and bronchial asthma complicated with bronchitis or pneumonia. Good results were also obtained in paroxysmal bronchial asthma. The treatment may also be important in management of patients who undergo tracheotomies, especially in those with acute bulbar poliomyelitis.

Science News Letter, August 1, 1953

IN SCIENCE

VETERINARY MEDICINE

4-Point Campaign Overcomes Hog Disease

► A FOUR-POINT program against deadly hog cholera has virtually eliminated the disease from Canadian swine herds, Dr. Orlan Hall, assistant veterinary director general of Canada, told an American Veterinary Medical Association meeting in Toronto.

The four point program is:

1. Slaughter of diseased herds and indemnification to swine owners.

2. Required cooking of all garbage fed to hogs.

4. Quarantine for 30 days of all live swine entering Canada.

4. Thorough, periodic cleaning and disinfecting of public stockyards, freight cars and trucks used in handling and marketing swine.

There have been no reports of hog cholera in Canada in four of the last five years, Dr. Hall said.

Since the four-point plan went into effect in 1904, 168,200 hogs have been destroyed, at a cost of about \$1,000,000, or approximately \$20,000 a year. This is less than the costs of vaccinating swine against hog cholera each year in many counties in the United States, Dr. Hall said.

Science News Letter, August 1, 1953

CHEMISTRY

Chemistry Asked to Do New Agricultural Tasks

► CHEMISTS WERE called upon by Clyde Williams, director of Battelle Institute, Columbus, Ohio, to develop new chemicals to join DDT, 2,4-D, soil conditioners and fertilizers to perform the following agricultural tasks:

1. Enable plants to absorb considerably more of the sun's energy than the present 4%.

2. Regulate the loss of moisture from foliage and thus cut down the damages from drought.

3. Improve the nutritional quality of foods, in addition to simply increasing bulk yields.

4. Force soybeans and other crops to mature fruits at the same time, thereby facilitating mechanical harvesting.

5. Impart new qualities to plants such as stiff stems, deep roots, and a high percentage of usable parts.

The nation's population is increasing annually at a rate of 2,000,000 persons, Mr. Williams declared. At the same time usable acreage and farm labor force are decreasing.

Science News Letter, August 1, 1953

THE FIELDS

VETERINARY MEDICINE

Improved Surgery Gives Old Pets Longer Lives

► AGED PETS now have a better chance of surviving surgical operations that can add to their years of active life.

By use of new anesthetics, better diagnostic methods and a clearer understanding of aging problems in animals, as well as improved surgical methods, older animals have more hope of pulling through delicate operations, Dr. C. L. Blakely, Boston veterinarian, told the American Veterinary Medical Association convention in Toronto.

Age of pets cannot be measured in years alone, Dr. Blakely said. Some dogs are senile at eight or nine years, while others are healthy and good surgical risks at 12 to 14 years old. Though older dogs take longer for the healing process, he said, this disadvantage may be offset by greater immunity to many infections and by a more relaxed nature than young dogs have.

A new surgical technique allowing pets with hip injuries to walk normally again was described to the convention by Drs. A. T. Knowles, Jack O. Knowles and Robert P. Knowles, Florida veterinarians. Chronic hip dislocations or hip bone fractures at the joint are corrected by fastening the hip bone to the pelvic bone with strips of tendon from the animal's thigh, the veterinarians said.

Thigh tendons for the operation may be taken from the patient or from another dog without ill effects, they said.

According to the veterinarians' report, several other methods of treating such hip injuries in pets can result in immobilization of the joint, leaving the animals partially crippled.

Science News Letter, August 1, 1953

ICHTHYOLOGY

Fish in Tide Pools Find Their Way Home

► FISH IN little tide pools on the beach seem to know the meaning of "home sweet home."

Early in life, members of the small finny species known to science as *Clinocottus analis* pick out a particularly rocky pool and spend a good part of their lives in and near it, George C. Williams, University of California at Los Angeles ichthyologist, has found.

At high tide when their home is several feet under, they follow the tide in toward shore, swimming around in a wide area. But when low tide comes, they are back in their own pools. Many of the small fish may share the same pool.

The movements of the fish were followed by tagging them with various combinations of colored beads.

It is not known just why *Clinocottus* picks one pool over another and remains loyal to it. The pool must be a permanent one. Many seaside pools are temporary and drain at low tide so that the fish are exposed and die or fall prey to crabs and other predators.

The fish may have some sort of homing mechanism that helps them to identify their own pool each time.

Science News Letter, August 1, 1953

TECHNOLOGY

Patient Talks Back in New Hospital Call System

► THE ARMY plans to install a new nurse call-and-talk device in all of its new permanent hospitals.

Although nearly twice as expensive as the common buzzer-and-light system, the new system improves patient care, saves time for doctors and nurses and increases nurses' availability, trial tests at two Army hospitals revealed.

When the patient presses a button, chimes sound and signal lights flash on where nurses are likely to be. A light also blinks on over the patient's room door. When the nurse answers, she and the patient can talk over a two-way communication line.

Science News Letter, August 1, 1953

PSYCHOLOGY

Music Can Be Used to Communicate "Message"

► A MUSICAL composer can use tempo, pitch, key, harmony and rhythm to communicate a well-defined and rather broad "message" to an average listener.

This has been established at the University of California at Los Angeles by Genevieve Rogge under the direction of Dr. Franklin Fearing, professor of psychology.

A group of 18 subjects representing high, medium and low musical levels were interviewed individually after listening to three unfamiliar selections of modern music. The interviews revealed a striking similarity among the group as to what the music represented to each. Significance of the music seemed to involve much more than a simple indication of an overall mood or emotional quality.

In general subjects were able to distinguish mood, absence or presence of conflict, how conflict was resolved, whether the theme was real or fictitious, type of people or things music was about and elements of satire.

Another group of 90 subjects was asked to select patterns that best fit three musical selections played for them. Choice of patterns was consistent with those intended by the composer and did not differ significantly with musical levels of the subjects.

Science News Letter, August 1, 1953

VETERINARY MEDICINE

Warn Against Milk From Antibiotic-Treated Cows

► A WARNING against possible ill-effects on humans consuming milk from cows treated with antibiotics was issued at a meeting of the American Veterinary Medical Association in Toronto.

The public health committee of the AVMA reported that when antibiotics are used to treat mastitis in dairy herds, milk from the treated cows can create antibiotic sensitivity in humans who drink their milk. All milk from treated cows should be withheld from the market for at least three days after antibiotics are given, the committee recommended.

Science News Letter, August 1, 1953

ENTOMOLOGY

Wild Bees Make War On Imported Honeybees

► GAS AND blitzkrieg are used by wild Bolivian bees in a running warfare against imported honeybee colonies in Bolivia.

One species squirts a pungent liquid on the honeybees, destroying their natural odor. This throws the honeybees into confusion, and they may start fighting among themselves. Blitzkriegering bees have a stinger so long and strong it can pierce a leather glove. When they strike a honeybee colony, they overcome it in short order.

The most effective enemy of the little honeybees is a large black bee armed with strong jaws. Though the honeybees fight valiantly in defense of the colony, they usually suffer three times the casualties of the black giant.

Bolivian beekeepers, naturally, are allied with the honeybees in this warfare. The most effective defensive measure they have discovered is to capture alive some of the marauding wild bees, dust them generously in arsenic powder or ant killer, then let them go.

The poisoned bees bee-line home, and shortly afterwards the pillage stops, probably because of the spread of the poison in the wild bee hive, it was reported in *Foreign Agriculture* (June).

Science News Letter, August 1, 1953

ORNITHOLOGY

Rare Paradise Bird In U. S. From New Guinea

► A RIBBON-TAIL bird of paradise, one of the rarest and most spectacular of these spectacular birds, has just been added to the Bronx Zoo collection. This specimen is the first ribbon-tail exhibited outside of Australia.

The ribbon-tail was part of a collection of 18 birds of paradise just received from New Guinea. The male of this rare species was only discovered in 1939 in New Guinea.

Science News Letter, August 1, 1953

TECHNOLOGY

3-D: A Two-Eyed Wonder

There is more to third-dimensional movies than meets the eye. Perched high above the balcony in his 3-D projection booth, the operator labors to keep things under control.

By ALLEN LONG

► IF YOU think it is bothersome to put on a pair of polarized glasses to watch a third-dimensional movie, pity the poor projectionist who must show the movie to you. He really has it tough.

Perched high in the balcony in a crowded projection booth, the nameless operator must look after a baby of a new mechanical species. In some ways the new baby resembles his big brother, the 2-D movie. But the character and personality of Hollywood's youngest child are wrapped up in new techniques.

They involve two complete films and often a stereophonic sound-carrying magnetic tape. Keeping films and sound properly synchronized can be a headache.

Born of an ailing boxoffice, the baby was christened Natural Vision. To see all three dimensions of him, you must don a pair of special specs. Without them, he is frustrating and fuzzy.

Natural Vision pictures are shot in the movie studio on two films at once. One film captures the scene for your left eye and the other film records it for your right eye. Prints of these two films are shipped to local theaters and must be shown simultaneously on two movie projectors.

Intermission for Changing Reels

Until now, most theaters have needed only two projectors. But now two machines are needed just to show one "reel" of movies such as "Bwana Devil" and "House of Wax." An intermission must be called when the first pair of reels has been shown. When both projectors have been reloaded, the show resumes.

If Natural Vision movies sweep the country as their sponsors hope, chances are that the intermission will be dispensed with in time. Projection booths soon may be equipped with four projectors instead of two. This will be done so that when one set of projectors runs through, the other set can flash on instantly.

There is more to a properly shown 3-D movie than meets the eye. And, indeed, strange things can meet the eye if the movie is not properly shown.

Each of the films sent to the theater is exactly the same length. To produce the illusion of three dimensions, the projectionist must show these films in frame-for-frame synchronization.

If the projectors get out of "synch," the

third-dimensional effect can go to pot. When the hero whips out his revolver to plug the villain, the hero's arm suddenly divides during the fast action. It looks as if the hero had two transparent right arms, each gripping a trusty but transparent six-shooter.

Projectors Must Synchronize

Since movie audiences are not accustomed to actors having extra limbs, technicians have created devices for keeping the two projectors in exact step. A whirling metal bar linking the two projectors can do the trick. If one projector tries to run faster than the other, it is held back by the slow projector.

The coupling is more conveniently done electrically by selsyns. Selsyns are motor-like machines that work in groups of two or more. What one does, the others do. To show his 2-D shorts and previews, the projectionist merely flicks a switch. That uncouples projectors and sound reproducer.

Selsyns are almost a necessity when the 3-D movie is supplemented with stereo-

phonic sound. This sound system involves a magnetic tape carrying multiple sound tracks that feed a number of loudspeakers scattered through the theater. It replaces the usual sound-on-film tracks. Selsyns are needed to keep the sound reproducer in step with the projectors.

The critical business of holding films and sound in exact synchronization is reflected even in film splicing. If a film snares or snaps so that a part must be cut out, the patched film must be exactly as long as the original. If the projectionist snips out five frames of one film, he must replace the strip with a piece of black film five frames long. If he doesn't, the heroine suddenly may sprout two extra arms and legs and a spare head.

Mistakes Produce Laughs

A bunch of patches in a short strip of film can give you the impression you have a loose connection in your optic nerve. At one moment your left eye may go "dead," then come "on" again. It may black out a second time and flash back on just in time for your right eye to go off momentarily. No matter how miserable the hero is, this on-again, off-again business is so startling that it usually gets a laugh.

In addition to the business of keeping things running smoothly during the screen-



ANOTHER 3-D TECHNIQUE—This squeezed-up version of Marilyn Monroe will be fanned out by an anamorphic lens to cover a screen nearly two and a half times larger than today's standard. Known as CinemaScope, the process uses one film, a different set of 3-D "cues" and no viewing glasses. It promises to give bespectacled Natural Vision stiff competition.

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ing, the projectionist has other things to work out. His two projectors must be aligned so that the pictures from each projector fall upon the screen at the proper point. Misaligned machines may give the audience a crick in its neck.

Furthermore, the focal lengths of the lenses in the projectors must be much more closely matched than they usually are. And the third-dimensional effect can be killed if the projectionist fails to check the polarizing filter that screens each light beam as it leaves for the screen.

Pictures Tend to Darkness

Since these polarizing filters knock out about half the light leaving the projector, and since the polarized glasses worn by the audience filter out about half of what is left, the 3-D picture tends to be dark.

To increase brilliancy, the screen can be covered with a special aluminum paint. But this must be done with care or the pores in the screen will become clogged. Sound coming from behind-the-screen loudspeakers thus will be blocked and the audience will find it hard to hear.

These are not all of the 3-D projectionist's troubles by any means, but they should give you an idea of the complexities attached to adding one mere dimension to your theater enjoyment.

If three-dimensional movies become commonplace, it may turn out that many a projectionist will have a better build than muscle-men actors starring in the films. In an effort to keep intermissions at a minimum, film makers now are putting their 3-D movies on giant reels.

These reels, nearly two feet in diameter, hold 5,000 feet of color film and more than a mile of black-and-white film. The reels weigh about 50 pounds each and some of them must be fitted on a spindle only 5/16-inch in diameter.

Broken-Film Problem

In itself, this is hard to do, but the task is complicated because some of the reels go on spindles above the operator's head. Jockeying these heavy reels into position for a hard-to-hit spindle is bound to be good exercise for the arms and shoulders.

Another complication is brought on by the overweight reels. Unless made of a suitable steel, the 5/16-inch spindle is almost too weak to hold them. The spindles sometimes bend. This leads to snapped film as the reels wobble uncertainly in the projector's magazine.

Broken film was quite a problem at the outset of Natural Vision movies. Big take-up reels, never intended to perform such duty, moved slowly when the projector first came on. As the reel gathered speed, it quickly took up slack in the film. But the reel was spinning so fast when all the slack was absorbed that it frequently snapped the film.

The key to Natural Vision 3-D lies in polarizing light from the two projectors.

Facing the screen, the left projector shows, for instance, the picture to be seen by the left eye. Light from this projector shoots through a filter in front of the lens which polarizes the light in one direction.

The same thing happens to light leaving the right-eye projector, except that the light is polarized at right angles to that of the left-eye projector. This means that light from the projectors can enter your eye only through the proper polarized lens in the glasses you wear.

Since the whole polarizing job is done right at the projectors, the operator must keep a wary eye on the polarizing filters.

Heat from the strong arc lamps deteriorates the filters. To check the filters to see if they are polarizing the light properly, the projectionist must have someone down in the house look back at the projectors through polarized glasses. If the light beams appear a deep blue, the filters still are working. If the beams are blotchy, the filters need replacing.

To date, Natural Vision has broken box office records in town after town. Its promoters hope it will snatch persons away from their television sets. It is still uncertain, however, what will happen when the novelty of 3-D wears off.

But when opticians begin polarizing the lenses of your glasses, you will know that Natural Vision is here to stay.

Science News Letter, August 1, 1953

GENETICS

Growth Studies Aimed At Tracing Abnormalities

► GROWTH ABNORMALITIES may some day be traced back to the specific genes, the tiny hereditary units that caused them, and thus may be corrected.

This was foreseen here by Dr. Paul B. Sawin of the Roscoe B. Jackson Memorial Laboratory. Such backward tracing of growth can be likened to counting the rings in a tree's trunk to tell its age.

Variations in the structure and size of parts of the skeleton, digestive and endocrine systems in animals can be used as the growth landmarks, Dr. Sawin said. They give clues to the inherited and environmental factors responsible for the growth pattern, which lead either to favorable or unfavorable body proportions and to endocrine imbalances. These in turn may lead to abnormalities in reproduction, sex and maternal behavior.

Rabbits from the Memorial Laboratory have been bred with specific differences in ribs, or in size and shape of glands, for instance. Such rabbits are being used in cross-breeding and egg transplantation experiments to measure the differences in growth responsible for them.

Scientists hope to trace the growth patterns back to the embryonic stage, and then correct experimentally those differences in pattern that have led to the most unfavorable developments.

Science News Letter, August 1, 1953

AERONAUTICS

"Brain" Lands Airplanes; Wins Prize for Inventor

► AN ELECTRONIC device that schedules airplane landings at bustling airports won the Thurman H. Bane Award for its inventor, Benjamin F. Greene Jr. of the Air Force's Cambridge Research Center, Mass.

The award is given annually by the Institute of the Aeronautical Sciences.

Designed to cut the traffic snarl in skies over airports, the electronic machine figures out when a certain airplane should arrive at the airport. Then it determines whether any other plane is scheduled to land at the same time.

If the airstrip will be in use at the scheduled arrival of the plane, the machine calculates a slight detour for the pilot to fly. The detour will delay the plane's arrival until the first moment the landing field is open. The detour path is relayed by radio to the pilot.

This eliminates the conglomeration of planes "holding" at certain altitudes over the airport while waiting for landing instructions. Theoretically one landing every 30 seconds can be made at airports equipped with the device, providing the field can be cleared of passengers and plane.

Science News Letter, August 1, 1953

Free Booklet Tells How Deaf Hear Again With Startling Clarity, Ease

New hope for the 15 million persons in the United States who are hard of hearing was voiced by a noted Chicago acoustical scientist.

He reported that through the miracle of modern electronics it is now possible to overcome deafness even if the loss is severe.

He demonstrated how the deaf can hear again with a clarity and ease they never dreamed possible.

According to this electronic engineer, Mr. S. F. Posen of Beltone, "the longer a hearing loss is neglected, the harder it is to recapture certain speech sounds and understand them."

To acquaint the hard of hearing readers of this magazine with what may be done to help the deaf hear again with miraculous clarity, full authoritative details about deafness and how to overcome it are described in an informative, new, illustrated booklet, which will be sent in a plain wrapper without any cost or obligation. Send for your valuable free copy today. A postcard will do.



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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ADVANCES IN VETERINARY SCIENCE, VOL. I—C. A. Brandy and E. L. Jungherr, Ed.—*Academic Press*, 431 p., illus., \$9.00. Reviews the progress in the fields of research pertinent to veterinary science and the application of the newer knowledge to the practice of veterinary medicine.

ALGAL CULTURE: From Laboratory to Pilot Plant—John S. Burlew, Ed.—*Carnegie Institution of Washington*, 357 p., illus., paper \$1.25, cloth \$1.75. The growing of algae may one day solve the problem of how to feed the hungry populations of the world. This report tells of the experience of pilot plants in growing these one-celled plants and trying to make them palatable. (See SNL, July 25, p. 51.)

THE BCSO REVIEW OF SCIENCE IN U.S.A. FOR THE YEAR ENDING JUNE, 1952—British Commonwealth Scientific Office, North America—*Her Majesty's Stationery Office*, 40 p., paper, 35 cents. A general account of the distribution of scientific effort within federal, industrial and university institutions and a description of some of the more important developments.

A BIBLIOGRAPHY ON METEORITES—Harrison Brown, Ed.—*Univ. of Chicago Press*, 686 p., \$10.00. A key to all available data on meteorites, this chronologically arranged bibliography covers the whole of world literature on meteorites and related subjects published between 1491 and 1950.

BOREAL HEPATICAE: A Manual of the Liverworts of Minnesota and Adjacent Regions—Rudolf M. Schuster — *Univ. of Notre Dame Press*, American Midland Naturalist Vol. 49, No. 2, 427 p., illus., paper, \$1.75. A manual of the Hepaticae of Minnesota which adds 55 rare species to the flora of that state as well as 8 genera and 4 families.

BROWN COAL: Its Mining and Utilization—P. L. Henderson, Ed.—*Melbourne University Press (Cambridge University Press)*, 351 p., illus., \$7.50. The terms brown coal and lignite are sometimes used as synonyms, but this author uses lignite to refer to a woody material and brown coal for coal which is brown and contains more than 30% moisture.

CRACKING CATALYST ACTIVITY IN THE PRESENCE OF HYDROGEN SULFIDE—H. A. Dirksen, H. R. Linden, and E. S. Pettyjohn—*Institute of Gas Technology*, Research Bul. 4, 28 p., illus., paper, \$3.50. An exploratory study, using the steam-propane reaction, of the activities of metallic cracking catalysts.

EMPLOYMENT AND WAGES IN THE UNITED STATES—W. S. Woytinsky and associates—*Twentieth Century Fund*, 777 p., illus., \$7.50. Bringing together in a single volume data concerning the working people of the country, their various occupations and the number of employees in each, the ebb and flow of employment, wages paid, hours and working conditions.

EVOLUTION OF THE CALIFORNIA LANDSCAPE—Norman E. A. Hinds—*Cal. Div. of Mines*, Bul. 158, 240 p., illus., \$2.50. Characterizes with photographs, maps and drawings the significant surface features; and describes those surface

features as they are related to the geology and rock structure of the state of California.

EXPERIMENTAL STUDIES IN PSYCHIATRIC ART—E. Cunningham Dax—*Lippincott*, 100 p., illus., \$5.00. A mental hospital superintendent describes experiments in using music and painting as methods of treatment for the mentally ill.

FEDERAL FUNDS FOR SCIENCE: I. Federal Funds for Scientific Research and Development at Nonprofit Institutions 1950-1951 and 1951-1952—National Science Foundation—*Govt. Printing Office*, 48 p., illus., paper, 30 cents. "Modern war," the foreword points out, "uses scientific knowledge as insatiably as it does material resources." (See p. 68.)

A FREE SOCIETY: An Evaluation of Contemporary Democracy—Mark M. Heald—*Philosophical Library*, 546 p., \$4.75. Compares the theory and practice of democracy, moderate socialism, fascism and bolshevism, and discusses many of the difficulties and limitations imposed upon democratic practice by its own inherent nature.

FUNDAMENTALS OF BIOLOGY—M. J. Harbaugh and A. L. Goodrich, Eds.—*Blakiston*, 611 p., illus., \$6.00. A text for college students designed to meet the needs of all students regardless of their field of specialization.

GROWING UP IN NEW GUINEA—Margaret Mead—*New American Library*, 223 p., paper, 35 cents. This report covers field work completed 25 years ago among the Manus, a people with a Stone Age culture. It was originally published by *Morrow* in 1930. Miss Mead is currently among the same people to determine how the young people grew up and the effects of World War II on their civilization. (See SNL, July 4, p. 15.)

HOW TO RAISE A DOG: In The City And In The Suburbs—James R. Kinney and Ann Honeycutt—*Simon and Schuster*, rev. ed., 209 p., illus., \$2.95. Delightfully illustrated by James Thurber, this has been revised to include the changes that have taken place in the treatments of disease, the use of antibiotics, the popularity and value of obedience schools.

LABORATORY MANUAL IN PHYSICAL CHEMISTRY—Richard B. Ellis and Alfred P. Mills—*McGraw-Hill*, 94 p., illus., paper, \$3.50. Designed primarily to fit the needs of the small college, where the special equipment needed for more elaborate experiments is quite limited, and where the course must be operated on a limited budget.

NEW AND NONOFFICIAL REMEDIES, 1953—Council on Pharmacy and Chemistry, American Medical Assoc.—*Lippincott*, 623 p., \$2.65. Contains descriptions of the articles which stand accepted by the Council on Pharmacy and Chemistry as of Jan. 1, 1953.

NEW NUCLEAR DATA: 1952 Cumulation—National Bureau of Standards Nuclear Data Group—*Technical Information Service*, 52 p., paper, 25 cents. The material presented here is that which appeared in *Nuclear Science Abstracts*, Vol. 6, Nos. 1 through 23.

THE ORIGINS OF LOVE AND HATE—Ian D. Suttie—*Julian Press*, 275 p., \$4.00. Presents a new biological and psychological conception of love and hate, in which hate is shown as a frustration of the love need. Unlike the Freudian concept, its cornerstone is love, not sex.

OUR NEIGHBOUR WORLDS—V. A. Firsoff—*Philosophical Library*, 336 p., illus., \$6.00. A survey of the solar system is used as a basis for an investigation of interplanetary travel, which the author thinks is possible within a few decades.

THE PHARM-ASSIST MANUAL (FORMERLY GRAY'S PHARMACEUTICAL QUIZ COMPEND)—A. E. Slesser—*Mosby*, 167 p., \$3.50. Intended as a review-reference work for students and recent graduates in medicine and pharmacy. Written to conform to the U.S. Pharmacopeia.

PHYSICS PRINCIPLES AND APPLICATIONS—Henry Margenau, William W. Watson, and C. G. Montgomery—*McGraw-Hill*, 2d ed., 814 p., illus., \$7.50. Revised to place greater emphasis upon mks units. Material has been added on the cosmotron, the Schmidt camera, the transistor and the hydrogen bomb in this standard engineering-physics text.

PLOUGH AND PASTURE: The Early History of Farming—E. Cecil Curwen and Gudmund Hatt—*Schuman*, 329 p., illus., \$4.50. Tracing agriculture back to its beginnings in the Near East, this also treats of early farming in other parts of the world.

PRINCIPLES OF AUTOMATIC CONTROL—G. F. Akins and J. H. Kowalski—*Instrument Society of America*, 32 p., illus., paper, \$1.25. Discusses the justification for automatic control, the design of an automatic controller, and the application of a controller to a process.

REPORTS FROM INTERNATIONAL NON-GOVERNMENTAL SCIENTIFIC ORGANIZATIONS ON THEIR ACTIVITIES FOR WHICH UNESCO ALLOCATED SUBVENTIONS IN 1952—*United Nations Educational, Scientific and Cultural Organization*, 55 p., paper, free upon request direct to UNESCO Relations Staff, U. S. Department of State, Washington 25, D. C. Giving details of the ways in which nations are cooperating for the furtherance of scientific aims.

SURVEY OF NATIONAL RESEARCH COUNCILS FOR PURE AND APPLIED SCIENCE IN THE MEMBER STATES OF UNESCO—*United Nations Educational, Scientific and Cultural Organization*, 88 p., paper, free upon request to UNESCO Relations Staff, U. S. Department of State, Washington 25, D. C. Giving the address, names of officers, aims and scope and main activities. Since the first two were founded in 1916, 28 countries have established such agencies. (See p. 67.)

THE TRUE BOOK OF TOYS AT WORK—John Lewellen—*Children's Press*, 45 p., illus., \$2.00. When the young scientist in your family begins to wonder why the wheels make his wagon run smoothly down the walk or how his flashlight gives light, he may find the answers in this attractive book.

THE WORLDLY PHILOSOPHERS: The Lives, Times, and Ideas of the Great Economic Thinkers—Robert L. Heilbroner—*Simon and Schuster*, 342 p., \$5.00. Includes all the great economists from Adam Smith through Malthus and Ricardo, Karl Marx, Thorstein Veblen and Lord Keynes down to the economists now wrestling with the problems of our contemporary world.

Science News Letter, August 1, 1953

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TECHNOLOGY

Photograph Air Particles

▶ A GIANT homemade camera built by Stanford Research Institute scientists in California may pave the way toward better control over those tiny air-borne particles that eat away house curtains, soil coffee tables and corrode automobile bodies.

The camera, weighing more than 500 pounds, shoots pictures of tiny solid or liquid particles in the air. The particles can be as small as $2/25,000$ of an inch. Magnified 80 times by the camera lens, the particles are recorded on a 5 by 7-inch photographic plate and can be further enlarged 400 times.

The photographic image permits scientists to measure the tiny particles and to

observe their shapes. From this, scientists can get an idea of the air contaminants and can figure out where the particles came from. Then they can work out solutions to the pollution problem.

The camera "sees" a volume of less than $5/100,000$ of a cubic inch. Since aerosol particles usually are scarce in such a small field, multiple exposures are made so that several of the particles will register on a single plate.

An ordinary fog yielding a visibility of 1,000 feet has only about 200 particles in a cubic inch. A real "pea-souper" has about 2,000 particles in a cubic inch. Mathematically, neither of these fogs would have

a particle in the field of view. But since aerosol particles move rapidly in the air, multiple exposures should insure catching the image of several particles on each plate that is used.

The camera's fast-flashing light source consumes up to three kilowatts of power. It can flash 100 times a second, producing over 2,000,000 candlepower to light the small field of view. Exposure times range from one- to ten-millionths of a second.

SRI scientists hope the camera will help settle a present scientific controversy about polar fogs. Some experts believe tiny ice crystals form the main element in some of these fogs. Other experts believe water droplets chilled to temperatures below freezing make up the main element. If this is true, the droplets may crystallize when they strike an object.

Science News Letter, August 1, 1953

AN IDEA THAT PROVED ITSELF IN A SINGLE YEAR . . .

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National Flowers

► **GOLDENROD** IS coming into bloom over many miles of prairie and in millions of fencerow thickets; its bright sprays will return greetings to the sky until first frost signals the sun's retreat for another season. Sturdy, tough-stemmed, able to take care of itself in any kind of situation, it is a typically American plant.

So American is the goldenrod that many people advance its claim to honors as the American national flower—a spot in the world's official flora that has not yet been filled. There is some reason in this claim. It belongs to a highly developed, widely adapted genus; its four-score or so species

are found practically altogether on the North American continent, with only a couple of outliers in the Old World.

Symbolically it would be a good choice: as a member of the composite family, in which many small flowers combine to form one federated bloom, it typifies very neatly the American national motto, "E Pluribus Unum."

Principal contender against the goldenrod, and as stoutly supported by its advocates, is the columbine. This lovely flower also has its unique symbolism, for its common name is an appeal to the dove of peace, whereas its botanical title, *Aquilegia*, is supposed to be an eagle-reference, inspired, perhaps, by the resemblance of its flower spurs to the talons of our national emblem.

Goldenrod and columbine suffer from opposite but equal handicaps in their flowering time. The best known of our several native columbine species, found in practically all eastern and Midwestern woodlands, is out of bloom by July 4, except in the extreme northern part of this country.

On the other hand, no goldenrod is showing its gold until several weeks after Independence Day. So neither of the two contenders is able to be present at the celebration of the nation's birthday.

Goldenrod is further handicapped by the widespread though erroneous belief that it is a prime cause of hay fever. Actually almost no hay-fever cases can be traced to its pollen. However, its conspicuous blossoms reach their fullest development just when the ragweeds, the real hay-fever villains, are shedding their pollen. So the innocent goldenrod gets the blame.

Science News Letter, August 1, 1953

PSYCHOLOGY

Predict Children's Looks

► A **UNIQUE** project at the University of California at Los Angeles is enabling students to predict what their children will look like and to learn more about their ancestors.

Originated by Dr. Waldo Furgason, associate professor of zoology, the project consists of preparing a term paper in which students assemble and analyze all available genetic data pertaining to themselves. They select hypothetical mates. If they are dating someone with matrimony as their object, they can choose potentially real ones. Combined genetic data are used to predict how future children might look.

Hair and eye color, shape of face and ears, and condition of teeth are some of the factors governed by genetic laws. For example, only blue eyes can beget blue eyes, except in very rare cases. Dark colors tend to be dominant over light ones. Such laws are the basis of the predictions.

The project was initiated several years ago, and former students who have since married and have had children have returned to present evidence of accuracy of their predictions. In many cases the pre-

dictions are strikingly accurate, Dr. Furgason reports.

The assignment has also helped fill in many genetic blanks for some students. In this respect it has helped solve certain psychological problems.

Dr. Furgason cites the case of one student who is an adopted child. She had no knowledge of her parents, and this lack of knowledge seemed to be a psychological handicap. On the basis of an analysis of her own genetic characteristics, she learned much about her parents. This proved excellent psychotherapy in her case.

In other instances, students were quite different in appearance from other members of their families. This had given them a feeling of not belonging, a fear that perhaps they were adopted children. The genetics assignment often erased their fears because of a better understanding of certain genetic mechanisms not generally known to the public.

The project is of scientific value too. The assembling of such records is one of the few means of studying human genetics.

Science News Letter, August 1, 1953

ENTOMOLOGY

Insect Peter Pan Would Avoid Virus

► **THIS INSECT** could lick a childhood disease by not growing up.

A deadly disease of the European pine sawfly, called polyhedral virus disease, affects chiefly the young, or larval, stages of the insect. But during its prepupal stage—the stage between being a grubby larva and a winged adult—the sawfly is immune to the disease that infects it. The virus cannot start its deadly activity again until the adult state is reached.

Here is what happens:

The virus disease occurs only in the large digestive cells lining the mid-intestine of the insect. Another type of cell found there in little groups, the embryonic replacement cells, is immune to attack from the virus—why, no one knows.

During the change between larva and prepupa, all the digestive cells, infected or uninfected, are disintegrated and are replaced by the embryonic cells.

When this happens, the infection process is halted abruptly, because the mid-intestine is then made up entirely of immune cells.

If the sawfly could stay permanently in this stage, it would remain free from further ravages of the disease. But as development continues on toward the adult stage, the embryonic cells change into typical digestive cells, and the virus infection speedily recurs.

Up to the fifth molt, when normal disintegration of the digestive cells begins, molting of the young larva does not hinder multiplication of the virus. Sawflies that become infected with the virus too soon are doomed to die before they reach the temporary relief of the prepupal stage.

Dr. F. T. Bird of the Laboratory of Insect Pathology, Sault Ste. Marie, Ontario, made these findings known to scientists in the *Canadian Journal of Zoology* (June).

Science News Letter, August 1, 1953

HORTICULTURE

Nutgrass Controlled With CBP Herbicide

► **THE GARDENER'S** headache, nutgrass, can be controlled by fumigating soil with the herbicide CBP, or chlorobromopropene, plant physiologist Boydie E. Day of the University of California Citrus Experiment Station has discovered.

Preliminary field trials showed that 80 gallons of 55% CBP formulation per acre, injected eight inches deep with a weed gun, will give effective nutgrass control on well-tilled soils of moderate moisture.

CBP promises to provide a good means of spot treatment of small infestations of nutgrass, Mr. Day reports. It gives an immediate kill of vegetative parts of the nutgrass, and does not require tarpaulins and other special equipment for applying.

Science News Letter, August 1, 1953

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GENERAL SCIENCE

Shift Standards Research

Splitting National Bureau of Standards will raise cost of research about \$1,000,000, it is estimated. Shift of fuse and guided missile work to Defense Department was precipitate.

► AT LEAST \$1,000,000 additional cost to the government for research will be caused by the splitting of the National Bureau of Standards into two organizations.

A shift in the near future of over one-third of the Bureau's personnel, approximately 1,600 employees engaged in fuse and guided missile work, to Defense Department jurisdiction was announced jointly by the Secretaries of Defense and Commerce.

Not including the reduced efficiency due to morale and rearrangements, two administrative staffs will be needed. Facilities now used by both the basic and testing non-military, and the military applied research will be duplicated.

Scientists are puzzled by the precipitate rush of the two secretaries. This very fundamental change has been made without awaiting the report of the evaluating committee, consisting of eminent scientists and engineers nominated at the request of Secretary of Commerce Sinclair Weeks, and headed by Dr. M. J. Kelly of Bell Telephone Laboratories.

Dr. A. V. Astin was originally fired March 31 in a similarly precipitate manner without discussion with Secretary Weeks.

The announced removal of the defense research, largely ordnance, puts Dr. Astin on the spot again.

The idea of separating the defense and the non-military research of the Bureau of Standards has been discussed in the past months. The plan was to have Dr. Astin head the defense research, in which he is expert, under the new setup. Dr. Astin on April 17 agreed to serve as director of the Bureau of Standards until the Kelley evaluating committee reported, which will be in the fall.

Secretary Weeks assured Dr. Astin that when relieved of the directorship he would be given a government post equivalent to the Standards directorship. Head of the military research would be such a job. The announced split, promptly accomplished, might stymie this. It might even endanger the civilian direction of war research, which is considered essential if we are to keep up with our enemies in guided missiles, electronics, etc.

Some see in the removal of defense research from the Bureau of Standards an opening wedge to turning some of it over to private industry, despite the extraordinary success of scientists working directly for the government. Evidently this would not displease those in the Eisenhower administration who make "free enterprise" a slogan.

Science News Letter, August 1, 1953

INVENTION

Tractor Landing Gear Smooths Plane Landings

► A TRACTOR landing gear for rough ground has been invented in Italy. It is a multiwheel landing gear supporting a pneumatic Caterpillar track which consists of a stretched, tubular, continuous tire, flexible but inextensible. A supporting frame consists of rocker arms pivoted to the supporting legs of the plane.

The inventor, Giovanni Bonmartini, Rome, says that this gear will afford good stability to the plane, it automatically takes the best position so as to pass over obstacles and the shock of obstacles is apportioned over the maximum amount of area on the tire.

Patent number is 2,645,437, and it was assigned to "EST"—Etablissement Sciences Techniques, Vaduz, Liechtenstein.

Science News Letter, August 1, 1953

Firebugs deliberately set 1,580 forest fires in 1952.

Questions

GENETICS—How could growth abnormalities be traced? p. 75.

GENERAL SCIENCE—Where do most of the funds spent for federal research go? p. 68.

PSYCHOLOGY—What are main goals of life in the comic strip world? p. 71.

TECHNOLOGY—Why is there an intermission during Natural Vision movies? p. 74.

VETERINARY MEDICINE—How has Canada virtually eliminated hog cholera? p. 72.

VITAL STATISTICS—What years now show the highest death rate from polio? p. 69.

Photographs: Cover, Clifford Matteson; p. 67, UNESCO; p. 69, Sylvania Electric Products Inc; p. 70, Corning Glass Works; p. 71, Westinghouse Electric Corporation; p. 74, 20th Century-Fox; p. 79, Radio Corporation of America; p. 80, Eastman Chemical Products, Inc.

ZOOLOGY

Hawaiian Duck Facing Sudden Extinction

► SUDDEN EXTINCTION faces the mottled brown Laysan teal, *Anas wyvilliana*, found only on a single island of the Hawaiian group.

Director Paul L. Breese of the Honolulu zoo reports only about three dozen of the once plentiful ducks are left on Laysan island, which lies about 1,000 miles northwest of Oahu. The flocks were decimated by plumage hunters about the turn of the century, and they have waned in numbers since.

Although the birds are protected by law, their island home is so remote that effective policing is not possible. "The entire population of Laysan teal could easily be wiped out by the crew of a fishing vessel in need of food," Dr. Breese said.

Dr. Breese hopes to bring some of the ducks to the Honolulu zoo in an effort to raise them in captivity.

Science News Letter, August 1, 1953

ENGINEERING

Vibrations From Trucks Won't Shake House Down

► BIG CITY buses, heavy trucks, and moving vans rumbling past your house probably will do little damage—if any at all—by setting up vibrations in the house.

Generally speaking, structural vibrations would have to become severe before damage would occur. At these vibration levels, occupants would flee the building because the vibrations would be "unbearable," the Building Research Station in London reports.

Science News Letter, August 1, 1953



ROBOT MONITOR—New television picture tubes that provide sharper pictures and last longer are being produced with the aid of this electronic "guinea pig," which has an unusually sensitive instrument to monitor baking oven temperature.

• New Machines and Gadgets •

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 685. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

❁ **SHELTER SIGN** can help your town's civil defense efforts by pointing to safety quarters during possible air raids. The adhesive-backed sign is marked in four-inch yellow block letters against a black background. An associated arrow can be pointed in any direction.

Science News Letter, August 1, 1953

❁ **"BULLET PROOF"** aprons that stop a .38 caliber bullet fired eight feet away now are being used by an airplane company to guard its personnel against flying bits of metal in machine shops. The aprons consist of glass cloth laminated with a special polyester resin. They weigh less than three pounds each.

Science News Letter, August 1, 1953

❁ **WATER REPELLENT** has a wide range of uses running from waterproofing paper plates and concrete walls to reducing rain seepage into soils. Applied by brush, spray, dip or by mixing into the ingredients of articles being made, the repellent is a solution of sodium salts of certain silicones. It even can be applied to dirt roads to reduce maintenance.

Science News Letter, August 1, 1953

❁ **SLENDER TUBE** made of a butyrate plastic, as shown in the photograph, has been designed as an applicator for weed-



killing solutions. Stored in the transparent green tube, the weed-killer is dispensed through a metal nozzle at the end of the tube that works plunger fashion.

Science News Letter, August 1, 1953

❁ **CORDLESS MICROPHONE** can be carried through the audience, and increases flexibility of the public address system. The

microphone actually is a small battery-operated radio transmitter. It broadcasts to a receiver which feeds the public address loud speakers. The "mike" has a two-mile range and must be licensed.

Science News Letter, August 1, 1953

❁ **SAFETY FUSE** plug for lamps, TV sets, fans, irons and other electrical appliances has an easily replaceable six-amp fuse built into each prong. If a short develops in the appliance, the fuses in the plug blow, thus keeping house fuses intact.

Science News Letter, August 1, 1953

❁ **PLASTIC DOOR** guards for autos fit along the edge of the doors and keep the paint from chipping when the door is opened in tight quarters. Made in red, green, black, clear or chrome finish, the guards snap on and lock into place on all makes of cars.

Science News Letter, August 1, 1953

❁ **INSECT-KILLING PAINT** contains 2.5% DDT that kills insects coming in contact with it over a long period of time. Made in white, cream, ivory, yellow and "clear," the paint can be sprayed, brushed or rolled on walls in houses, restaurants, hotels, stores and other buildings. It is said to kill flies, ants, bedbugs, spiders, moths, roaches and water bugs among other insects.

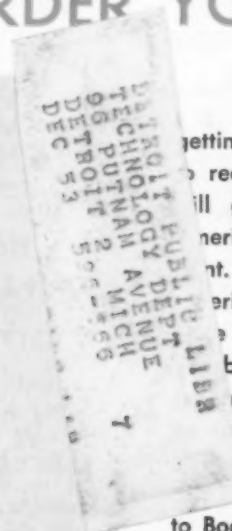
Science News Letter, August 1, 1953

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Do You Know?

Grass is the cheapest and most effective means of holding rainfall in the soil.

Motor vehicle accidents injure 36 civilians in the U. S. for each G.I. wounded in battle in Korea.

A new, improved strain of wheat, Onas 53, will be available for certified seed producers in 1954.

Salamanders of the smallest species are barely three inches long and are not nearly as thick as a lead pencil.

Tattooing has been traced back as far as 2000 B.C. in Egypt and 1100 B.C. in China, and probably was practiced in prehistoric times.

Two new varieties of head lettuce, named Alaska and Jade, have been developed; each is suitable to grow in a special area and season of the year.